U.S. TRADE AND DEVELOPMENT AGENCY

EXECUTIVE SUMMARY

FEASIBILITY STUDY ON HYDROCULTURE TECHNOLOGY IN MOROCCO

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U.S. Firm: DSAL International, Inc.
Main contact name: Sharon Hamre
Current phone: 612-449-9135
Fax: 612-476-7456
E-Mail: schamre@ix.netcom.com

Project Sponsor: ONEP
Main contact name: Mr. Lahoucine Tijani, Director
Current phone: 212-7-73-40-04
Fax: 212-7-77-54-08

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Feasibility Study Preamble

Master plans of water resources development in Morocco conclude that the deficit between future uses and the available conventional fresh water resources will begin to appear toward the year 2017 for the southern basins and toward 2020 for some basins of the northwestern regions. As an alternative solution to conventional resources, seawater desalination is being utilized more and more; the related technology being well-mastered. The drinking water supplies of Laayoune and Boujdour in the Sahara region are already partially or entirely ensured using desalinated seawater.

Seawater desalination costs are similar or somewhat higher than the costs of classical water supply techniques. However, desalination is clearly the least expensive solution in areas without any other water resources than the sea.

With a view to further enriching its experience, Office National de I'Eau Potable (ONEP) continues its contacts with specialized institutions to follow the evolution of the desalination technology, as well as with international businesses, which propose services in this field.

Moreover, several studies for preliminary projects are being evaluated, including this feasibility study of the new Hydroculture Tm Technology desalination process developed by the American company D'SAL International, Inc. (D'SAL) 1800 Pioneer Creek Center, Maple Plain, MN. On receipt of a grant from the United States Trade and Development Agency (TDA) to partially fund this feasibility study, ONEP entered into an agreement with D'SAL.

Combining the classical technology of reverse osmosis with mining technologies, the Hydroculture Tm Technology process consists of saving the required energy (50 to 70 bar) at the entrance of the reverse osmosis membranes, by using gravity energy through the design of an under ground system at a depth of 500 to 700 meters.

The feasibility study of this process was conducted by USAL at sites selected by ONEP. It involved the sites of Agadir, Tan Tan, and Laayoune. This study determined and evaluated the economic and financial aspects of this process.

The Reports included the following tasks:

1. Task 1: Current situation and basic data (site selection, seawater intake system, and pre-treatment system)

2. Task 2: Desalination system preliminary design and economic and financial evaluation
3. Task 3: Complementary investigations and analysis of the results (At the site of Agadir, beach well test and analysis and core drill and analysis)

The primary engineering contractor for the study was Wenck Associates, Inc., 1800 Pioneer Creek Center, Maple Plain, Minnesota 55359. Mining engineering services were provided by Thyssen Mining Construction of Canada Ltd., 2409 Albert St. N., Regina, Sask., S4P 3E.